Low Cost Carrier in China and Its Contribution to Passenger Traffic Flow

YAHUA ZHANG
ZHEN LU

The gradual liberalisation of China's air transport sector led to the launch of some new private airlines and low cost carriers (LCCs) in the mid-2000s. However, the large population and geographic market do not necessarily mean that a conducive environment is ensured for the growth of these new airlines. The domestic market is still dominated by the three state-owned carriers that have access to government aid whenever they are in trouble. Despite the less favourable environment, China's only low cost carrier Spring Airlines has managed to grow and achieved limited success. The presence of Spring Airlines on a domestic route has contributed to an increase in passenger volume by 23%, holding other factors constant. This study also finds that when the jet fuel price increases by one dollar per gallon, the number of passengers carried will drop by 6%. The tourism and economic benefits brought about by LCCs should be the driving forces for the change in air transport policies in China.

KEYWORDS. Low cost carriers, passenger traffic, Spring Airlines

低成本航空在中国及其对航空客流量的贡献

中国航空运输业逐步放松管制导致了 2005 年前后私营和低成本航空公司的建立。中国庞大的人口数量和土地面积并不意味着就会提供一个有利于这些新航空公司茁壮成长的外部环境。中国国内航空市场仍被国有控股的三大航空公司主宰着，并享有政府补助的特权。 尽管如此，中国唯一的低成本航空公司，春秋航空，仍然不断成长并取得了一些成功，春秋航空的出现使得每条航线的客运量平均增加 23% 。本文还发现当航空油价上升一美元/加仑， 客运量就会降低 6%。 低成本航空公司带来的旅游和经济利益应当成为航空政策转变的驱动力。

关键词 低成本航空， 旅客流量， 春秋航空

Yahua Zhang is a Senior Lecturer…… in the School of Accounting, Economics and Finance at University of Southern Queensland, Toowoomba, Australia (E-mail: yahua.zhang@usq.edu.au).

Zhen Lu is a Lecturer…… in the School of Public Finance at Central University of Finance and Economics, Beijing, China (E-mail: luzhen2000@gmail.com…).

Introduction

Numerous studies have confirmed the negative effect of low cost carriers (LCCs) on the airfares of the routes they operate in the US and European aviation markets, widely known as the "Southwest effect" and the "Ryanair effect" (see for example, Alderighi, Cento, Nijkamp,

& Rietveld, 2012; Morrison, 2001; Vowles, 2001). Bennett and Craun (1993) once estimated that if airfares on the routes where Southwest served were raised to the level of the airfares on the routes without Southwest, the industry revenue would increase by US$2.5–3 billion (holding traffic constant). Using data from 1998, Morrison (2001) found that the airfares of a route were lower but varied to different degrees, depending on whether Southwest was operating on that route, or on an adjacent route, or even when it was only present at route endpoint(s) but not serving that route. He estimated that passengers enjoyed a saving of $12.9 billion in airfares in aggregate in US airline markets. Shumsky (2006) noticed that in 2005 Southwest carried more passengers than any other airlines in the US market and had forced traditional airlines to increasingly rely on airline alliances for a larger proportion of their traffic. In Europe, LCCs have already been a threat to traditional airlines including British Airways, KLM Royal Dutch Airlines and Air France.

A. Zhang, Hanaoka, Inamura, and Ishikura (2008) suggested that a similar effect may also exist in Asia. However, studies into the application of this business model in the Asian aviation market are rare due in part to the relatively short history of LCCs in this region. China is the world's most populous nation and geographically large, with a large group of low income people who may be interested in switching from train and bus services to air. However, it was only until 2005 that the first LCC service was launched in China. The development of LCCs and private airlines has been impeded by various regulatory barriers, including market access, aircraft purchases and fleet build-up (A. Zhang et al., 2008).

The effect of the entry of LCCs on airfares in China has been obvious and widely reported in the media, but the contribution of China's LCCs in facilitating the movement of people is not as noticeable. In a comprehensive literature survey, Wang and Song (2010) noticed that studies of air travel demand related to the Chinese region are rare due to data unavailability. To fill the gap in the literature, this study uses a gravity model to reveal the

remarkable growth in passenger traffic on the major domestic routes to and from Shanghai when China's only LCCs, Spring Airlines is present. This research is also motivated by the fact that China's private airlines including LCCs operate in a generally unfavourable, if not hostile, environment. Our analysis shows that there is an urgent need for the government to remove the barriers and take actions to facilitate the growth of this new type of business.

Chung and Whang (2011) argued that research on the impact of LCCs on travel demand yielded mixed results. Even though most research points to positive effects, the UK Civil Aviation Authority (2006) reported that the expansion of LCC services had little effect on the overall growth in air traffic. However, it appears that little doubt has been cast on the effect of generating new tourism demand by LCCs on the tourism routes. For example, Graham and Dennis (2010) found that new LCC services increased the number of tourists to Malta in 2007 after the government provided incentives to attractive new airlines. Similar finding was reported in Chung and Whang (2011) on Korean Island tourism. It is worth noting that most routes in our study are not only associated with a large number of leisure travellers, but also a heavy presence of business passengers.

The next section will briefly describe the development of China's civil aviation industry in the last two decades, particularly the recent development of private airlines and LCCs, followed by the presentation of the model and data used in this article. The section of Results and Discussion will discuss the results and implications to policy makers and regulatory authorities. The last section will draw some conclusions.

Aviation Reforms in China and the Development of Private Airlines and LCCs

The commencement of the deregulation movement in China's airline industry can be traced back to the late 1980s. In the period 1987-1991, six state-owned trunk airlines based in the regional capital cities emerged, hiving off from the monolithic Civil Aviation Administration of China (CAAC) that acted as both government agency and air service provider, including Air China based in Beijing, China Eastern in Shanghai, China Northwest in Xi'an, China Northern in Shenyang, China Southwest in Chengdu and China Southern in Guangzhou. At the same time, there was a rapid growth in the number of local airlines, which were established by local governments or jointly with the CAAC whose role since the late 1980s has become more about civil aviation supervision and regulation instead of airline operations. The partial privatisation of state-owned airlines and deregulation of airfares in the late 1990s led to strong competition and price wars were common on many of the domestic routes, which was one of the reasons resulting in the 2002 airline mergers. The massive mergers in 2002 that were supported by the CAAC eliminated some of the trunk airlines and local carriers, and created three dominant airline groups: Air China, China Eastern and China Southern (Y. Zhang & Round, 2008). As a result, the big three and the fourth largest airline group, Hainan Airlines, as well as a few relatively healthy local airlines operated in China's domestic market.

At the end of 2004, the CAAC promulgated the criteria of setting up new carriers that took effect from January 2005, sparking a new wave of establishment of airlines in China in 2005 and 2006. Unlike the wave in the earlier 1990s, almost all the new airlines in this period were set up by private investors, thanks to the relaxation of foreign ownership restrictions in 2002 and the new regulation in 2005 that encouraged private investment into key aviation sectors including airlines and airports. Private carriers Okay Airways based in Tianjing, United Eagle Airlines in Chengdu and Spring Airlines in Shanghai launched their maiden flights in 2005. Okay Airways and Spring Airlines positioned themselves as LCCs and

believed that this model would help them secure a slice of the market dominated by their state-owned counterparts. Also in 2005 Shenzhen Airlines, a local state-owned carrier based in Shenzhen, became the largest privately owned airline in China after it sold 65% of its equity to two private enterprises. In 2006 two other private carriers Juneyao in Shanghai and East Star Airlines in Wuhan began their services.

However, seven months after its launch, Okay Airways announced to give up the LCC model. According to the President of Okay, the high percentage of uncontrollable costs in the total costs made it unlikely to substantially cut the operating costs (Z. W. Zhang & Meng, 2005). Z. W. Zhang and Meng (2005) also noted that controllable costs, including labour and management costs, only account for 20% of the total costs, compared to 40-50% for foreign carriers. Taxes on the purchase of aircrafts, fuel costs, and airport charges are among the uncontrollable costs. In addition, China's aviation environment has been less friendly to LCCs and private carriers as manifested by the facts that market access is subject to some kind of regulation that is favourable to existing airlines, and that they have to incur high costs to recruit pilots and other skilled personnel from other airlines because of the restrictions put on the movement of people. The President of Okay once complained the difficulty of entering the profitable routes associated with Beijing, Shanghai and Guangzhou (Z. W. Zhang & Meng, 2005). This has been evidenced by the fact that the inaugural routes of most private carriers were those in which the major carriers had little interest.

The lack of effective enforcement of the antitrust laws in the aviation markets might be another important factor that has impeded the development of LCCs and private carriers. Price collusion and predatory pricing in China's airline market were common (Y. Zhang & Round, 2011). Mergers in the air transport sector were rarely investigated and challenged, especially when private airlines were taken over by their state-owned counterparts such as the takeover of the largest private carrier, Shenzhen Airlines, by Air China in 2010. In 2009 the

Wuhan-based private carrier, East Star Airlines, was forced to suspend operations by the CAAC due to its heavy indebtedness and officially went bankrupt after its restructuring application was rejected by the court. The bankruptcy was controversial and it was speculated that the government initially wanted to see it merged by Air China, but after the negotiation collapsed, the government decided to liquate it so that Air China could pick up the remnants of this private airline and its market share in Wuhan. The fate of United Eagle Airlines is no better, which was also taken over in 2009 by state-controlled Sichuan Airlines due to its poor financial performance, and renamed to Chengdu Airlines.

As of 2012, China's aviation market was still dominated by Air China, China Southern, China Eastern and Hainan Airlines and their subsidiaries, commanding a market share of more than 90% in both passenger and cargo markets. Private airlines Spring, Okay, and Juneyao share the leftover. Unlike their state-owned counterparts that constantly receive capital injection from the government, especially during the 2008 global financial crisis, these private carriers have been working hard for an initial public offering (IPO) in the share market to finance the development plan.

Spring Airlines is the only LCC in China operating a fleet of 30 aircrafts on more than 40 routes, including flights from Shanghai to Hong Kong and Japan in 2012. Spring Airlines was set up by the Shanghai Spring International Travel Services that has been supplying a steady stream of tourist passengers to this LCC since 2006. Leisure travellers, even some of the business travellers, are sensitive to airfares. In fact, more and more companies have issued travel policies to control business travel expenses (Bender & Stephenson, 1998; Mason, 2000). This is also the case in China. Therefore, Spring Airlines not only targets leisure travellers, but also endeavours to attract price-sensitive business passengers.

China National Radio (2012) reported that Spring Airlines had six years of consecutive profits since its birth and recorded a profit of 500 million yuan in 2012. It maintains a high load factor of about 95% through offering low airfares, well above the industry average of 70%. Spring Airlines has tried many ways to save costs including the use of its own computer reservation system and encouraging online sales. Cost saving also comes from the improved daily aircraft utilisation rate which reaches 12-13 hours compared with 9-10 hours for China's traditional airlines (Liu, 2012).

Similar to other private carriers, Spring Airlines faces restrictions on the entry into some lucrative routes and ideal time slots. The Shanghai-based LCC had to wait for six years before it was allowed to fly the Shanghai-Beijing route in 2011. The CAAC approval must be gained before they can go ahead with their expansion plan and the purchase of aircrafts. The approval process could be lengthy depending on China's political relation with the US and Europe as well as trade policies at a certain point in time. In addition, whether the antitrust laws can be effectively enforced in the airline market to ensure a fair competition environment is also key to the future development of Spring Airlines and other private carriers.

Methodology and Data

The gravity model has been successfully applied in international trade, transportation, marketing, retailing, and many other spatial-related fields (Bergeijk & Brakman, 2010). In transportation research, the model explains the flow of goods and people between pairs of locations in terms of income and distance. Wang and Song (2010) noted that the gravity model has a long history of applications in air travel demand studies and is still widely used in recent years. Distance is a key element of the gravity model that typically measures the

transportation cost, but a range of dummy variables such as cultural and religion differences and policy restrictions may also be included to represent the costs and barriers associated with the movement of people and goods. The form of the gravity model used in this study is:

$$\ln(traffic)=\beta_0+ \beta_1\ln(GDP1)+ \beta_2\ln(GDP2)+ \beta_3 \ln(distance)+ \beta_4 fuel+ \beta_5 Spring+\varepsilon$$

The dependent variable is annual air traffic (passenger numbers and cargo volume) between two cities. GDP1 and GDP2 represent the two cities' gross domestic product (GDP). Apart from the distance variable that captures the transportation cost, the jet fuel price is also included as it would have an impact on an airline's fuel bill following Rey, Myro, and Galera (2011). The Spring dummy takes the value of 1 when Spring Airlines is present on the route. It is expected that the GDP variables are positively linked to the traffic flows while a higher fuel price would lead to higher airfares and have a negative impact on traffic volume.

As the headquarters of Spring Airlines is in Shanghai, our sample contains 35 routes between Shanghai and other domestic cities including the capitals of most provinces. We look at the time period from 2004 to 2010 during which Spring Airlines gradually entered 19 of these 35 routes. The passenger and cargo traffic flows between two cities come from the yearbooks Statistics on Civil Aviation of China (2005-2011) published by the CAAC. The GDP of Chinese cities can be found from the China City Statistical Yearbook(2005-2011). The jet fuel price data were reported by the US Energy Information Administration (EIA, 2012) and the annual average is used in our model estimation. Chinese airlines' summer and winter schedules begin in March and October respectively, so if Spring Airlines' entry occurred in October, we assume that its presence started from the next year while if it occurred in March, the LCC dummy would take a value of 1 for that year.

Results and Discussion

The descriptive statistics of the main variables used in the gravity model are reported in Table 1. Because of the nature of panel data, a Hausman test was conducted to see whether the random effects model or the fixed effects model is preferred. The Hausman test compares the differences of the fixed and random effects with the null hypothesis that the coefficients estimated by the efficient random effects estimator are the same as the ones estimated by the consistent fixed effects estimator. The random effects model makes full use of the information provided by cross-sectional and time series data, and is thus more efficient if the explanatory variables are not correlated with the unobserved effects. Our test did not reject the Hausman test, which means that the random effects model is preferred. To accommodate the potential serial correlation and heteroskedasticity problem, robust standard errors are reported.

Insert Tables 1 and 2 about here

All the variables have the expected signs (Table 2). The cost variables, distance and jet fuel, have negative signs while other variables are positively associated with the passenger traffic flow. The presence of Spring Airlines on a route would increase passenger volume by 23% on average. This is similar to what was reported in Gittell (2005) that there was at least a 30% increase in passenger traffic in every new market that Southwest Airlines entered. The largest increase with the entry of Spring Airlines occurred on the route from Shanghai to Shijiazhuang where the growth rate was 157% in 2010. The Shanghai-Lanzhou route recorded high increase rates of 72% and 87% respectively in 2009 and 2010 after the launch of LCC services. There are no close substitutes such as high speed rail services between Shanghai and these cities, which may partly explain the significant effect of the presence of Spring Airlines.

Unlike previous airline literature, the distance variable is not statistically significant in this study even if we do not include the jet fuel price variable, although we get the expected negative sign for this variable. This might suggest that geographical distance, which is an approximation of transportation costs and transport time, is no longer an important factor in the presence of LCCs. However, when the jet fuel price, a cost factor to the movement of people, increases by one dollar per gallon, the number of passengers carried will drop by 6%, holding other factors constant.

Interestingly, none of the independent variables is significant when the model uses cargo data as dependent variable, suggesting that an LCC has no obvious impact on the flow of goods. This is quite understandable because LCCs do not normally attach the same importance to the cargo market as to the passenger market, especially when they want to have a short turnaround time.

Although the impact of geographic distance does not appear to be significant in the presence of LCCs, the movement of passengers could be hampered by various intangible barriers which could not be quantified and included in the model, and their negative effects on the passenger flow should not be underestimated. A recent report on China's inflexible jet fuel prices has aroused wide public attention (Li, 2012). The jet fuel price per tonne in China is about US$100 higher than the world average – higher than those in some major Asian airports including Tokyo, Seoul and Singapore due to the near-monopoly status enjoyed by China's National Aviation Fuel Holdings. Administrative monopolies have long been subject to extensive criticisms, with demands that more competition needs to be introduced into the industries that are dominated by the state-owned or state-controlled enterprises. However, the 2008 Anti-Monopoly Law seems to be powerless in challenging administrative monopolies due to the generous exemption clauses. For example, Article 7 states that "in industries that implicate national economic vitality and national security, which are controlled by state-

owned enterprises, and in industries in which there are legal monopolies, the state shall protect the lawful business activities of those enterprises, supervise and control their conducts and prices for the products and services pursuant to law, protect the interests of consumers, and promote technological progress" (Yueh, 2011, p.285). Also in this antitrust law, public interest is one of the goals stated in Article 1 but there is a lack of a systematic and transparent interpretation of the term "public interest," and this could be taken as an excuse to protect state enterprises and certain monopoly industries (Y. Zhang & Round, 2012). Our regression results clearly show the detrimental effect of the lack of competition in the jet fuel industry. Any actions that suppress the fuel price will boost the flow of people and benefit the local economy.

A fair competition environment is not only vital for the survival of LCCs like Spring Airlines, but also essential for the economic growth of the nation. However, it does not come automatically and could be hampered by inappropriate government policies and legislation and by the anti-competitive conduct of firms (Godfrey, 2008). A series of mergers in China's airline industry, including the 2009 merger between China Eastern Airlines and Shanghai Airlines, were not challenged by the antitrust agency, although their routes overlap on almost all the important domestic routes and some short-haul international routes to and from Shanghai. The state-owned carriers received state aid and significant capital injection during the 2008-2009 global financial crisis and constantly asked for more. This has undoubtedly given them a competitive advantage and created an unlevel playing field. This has also encouraged traditional carriers to match the pricing of Spring Airlines without the need to take actions to reduce their operation costs. It is also not surprising to see the quick disappearance of the names of some newly established private carriers, which were taken over by the big brothers that may not necessarily be more efficient and profitable.

LCCs have widespread impact on the local economy. Williams and Baláž (2009) argued that LCCs may attract inward investment because they may change the image of regional economy and enhance awareness of its business environment. However, the development of China's aviation market is very unbalanced with growth mainly driven by routes associated with a few major cities including Beijing, Shanghai and Guangzhou (Fu, Zhang, & Lei, 2012). Airports there constantly face capacity constraints, which makes it difficult for new airlines to obtain an ideal time slot, while airport facilities in small and medium sized cities are significantly under-utilised. In fact, the vast majority of China's flights are operated in the area to the east of Beijing-Guangzhou route, more than 60% of which are within the triangle area formed by Shanghai, Beijing and Guangzhou (Liu & Mao, 2007). Increasing competition from the high-speed rail services in this triangle will force China's airlines to keep an eye on a broader market in the next few years. Going international and intensifying the network in western China would be two directions for the future development of Chinese carriers, especially for LCCs.

The under-developed western areas need the support of air transport services in attracting new investment and looking for new development opportunities. Donzelli (2010) noted that LCCs represent an opportunity to develop the local economy by creating new employment and benefits from higher tourism revenues, and public policies could be used to provide incentives to regional airports to support low-cost network improvement. LCCs have led to tourism booms within Europe (Forsyth, 2006). Many regional airports in Europe were underutilised and the introduction of LCCs have helped to revitalise and modernise them, resulting in new and induced demand from passengers (Castillo-Manzano, Lopez-Valpuesta, & Gonzalez-Laxe, 2011). This research has revealed the impressive increase in passenger traffic, thanks to the presence of Spring Airlines, which may justify the need to provide incentives such as subsidies to entice LCCs to "go west". The policy of subsidising LCCs has

been a common practice and it especially makes perfectly good economic sense for a region to spend to attract LCCs (Forsyth, 2006). For example, Spain had a long history of subsidising charter airlines to build up the tourism industry (Doganis, 2002), and continued to subsidise LCCs to attract tourists, which was quite successful in the 2000s (Rey et al., 2011).

The CAAC has had a subsidy program on regional routes (issued in 2008, CAAC No. 17) in place with the airport construction fees (now renamed to Civil Aviation Development Fund) collected from passengers. Regional routes are called branch routes in China as opposed to trunk routes, referring to those linking two small and medium sized cities with a distance not more than 600 kilometres. The branch routes are put into three categories with those in western China receiving a maximum of 180 yuan per person if the load factor is below 30%. For the branch routes within the golden triangle of Beijing-Shanghai-Guangzhou, a maximum of 60 yuan per person applies if the load factor is below 30% and the subsidy amount is only 20 yuan per person if the load factor is between 60% and 80%. Although local governments are also encouraged to provide financial assistance, the magnitude of these subsidies is certainly not enough to help an airline servicing these routes break even, especially when many of the local governments themselves are running deficit and rely on subsidies from the central government.

Despite the less favourable environment for China's private and low cost carriers, Spring Airlines has managed to grow and achieved limited success. The central government has also realised that investment into aviation services in many remote western areas is cheaper than railways and highways. There is good opportunity for LCCs to get a fair share of the world's fastest growing commercial aviation market by developing their own competitive advantages apart from offering low prices. Y.Zhang (2012) found that both leisure and business passengers place little value on the size of network that an airline operates and that the brand name is not a significant factor in influencing the choice of air

travel. However, Chinese passengers place high values on punctuality and prefer to fly with airlines with higher on-time performance rates. This may suggest that by providing reliable and punctual services, LCCs could attract not only price-sensitive leisure travellers, but also business travellers who appreciate these qualities, which is exactly what Southwest Airlines has achieved.

Conclusions

The gradual liberalisation of China's air transport sector led to the launch of some new private airlines and LCCs in the mid-2000s. However, the large population and geographic market do not necessarily mean that a conducive environment is ensured for the growth of these new airlines. There needs to be a change in the current government policies that clearly favour state-owned carriers and new policies should be designed to encourage the entry of LCCs into the branch routes that have significant implications to the under-developed areas in western China, given the great contributions in facilitating the flow of people made by the presence of Spring Airlines. To our best knowledge, this is the first article that examines the effect of China's LCCs on traffic flow. Future research could look at the effect of the presence of LCCs on airfare, which will enable an interesting comparison of the operation of LCCs in China and the West. It is also important in future work to use the general equilibrium modelling approach to quantify the tourism and economic benefits brought about by China's LCCs. These benefits should be the driving forces for the change in air transport policies.

Acknowledgement

An earlier version of the article was presented at the 16th Air Transport Research Society (ATRS) World Conference, June 27-30, 2012, Tainan, Taiwan. The authors are grateful to the conference participants for their helpful comments. The authors are responsible for any errors.

Table 1. Descriptive Statistics of the Main Variables.

Variable	**Observations**	**Mean**	**Standard deviation**	**Min**	**Max**
Passenger	245	950186	1108036	66856	7674438
Cargo (tonne)	245	23506	44113	543	270430
GDP1 (million yuan)	245	1215289	317308	745027	1716598
GDP2 (million yuan)	245	252879	230486	4823	1411358
Distance (kilometre)	245	1405	587	423	3525
Fuel	245	1.95	0.52	1.15	2.95
Spring	245	0.18	0.39	0	1

Table 2. Regression Results (Dependent Variable: Number of Passengers).

	Random effects		**Fixed effects**	
	Coefficient	Robust std. err.	Coefficient	Robust std err
Constant	3.87***	1.48	1.66	0.10
logGDP1 (million yuan)	0.52***	0.16	0.71***	0.17
logGDP2 (million yuan)	0.31***	0.11	0.16	0.10
logDistance (kilometre)	-0.20	0.19		
Fuel	-0.06***	0.02	-0.07***	0.02
Spring	0.23***	0.06	0.23***	0.06
Within R^2	0.65		0.65	
Between R^2	0.33		0.32	

Overall R^2	0.36	0.28
Observations	245	245

Note: ***significant at 1%, **significant at 5%, *significant at 10%.

References

Alderighi, M., Cento, A., Nijkamp, P., & Rietveld, P. (2012). Competition in the European aviation market: The entry of low-cost airlines. *Journal of Transport Geography*, 24, 223-233.

Bender, A., & Stephenson, F. (1998). Contemporary issues affecting the demand for business air travel in the United States. *Journal of Air Transport Management*, *4*(2), 99-109.

Bennett, R. D., & Craun, J. M. (1993). *The airline deregulation evolution continues: The Southwest effect*. US Department of Transportation, Office of Aviation Analysis, Washington, United States.

Bergeijk, P., & Brakman, S. (2010). *The gravity model in international trade: Advances and applications.* Cambridge, England: Cambridge University Press.

Castillo-Manzano, J. I., Lopez-Valpuesta, L., & Gonzalez-Laxe, F. (2011). The effects of the LCC boom on the urban tourism fabric: The viewpoint of tourism managers. *Tourism Management*, *32*(5), 1085-1095.

China City Statistical Yearbook. (2005-2011). Beijing, China: China Statistics Press, 2005-2011.

China National Radio. (2012). 春秋航空实现年度持续盈利 归功于高达 95%的客座率 [Spring Airlines: Consecutive profits attribute to its high load factor]. Retrieved from http://finance.cnr.cn/gs/201202/t20120219_509180304.shtml

Chung, J. Y., & Whang, T. (2011). The impact of low cost carriers on Korean Island tourism. *Journal of Transport Geography*, *19*(6), 1335-1340.

Civil Aviation Authority. (2006*). No-frills carriers: Revolution or evolution?* UK Civil Aviation Authority, London, UK.

EIA. (2012). U.S. Gulf Coast Kerosene-Type Jet Fuel Spot Price FOB. U.S. Energy Information Administration. U.S. Department of Energy, Washington, USA. Retrieved from http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=eer_epjk_pf4_rgc_dpg&f=a.

Doganis, R. (2002). *Flying off course: The economics of international airlines* (3rd ed.). London, England: Routledge.

Donzelli, M. (2010). The effect of low-cost air transportation on the local economy: Evidence from Southern Italy. *Journal of Air Transport Management*, *16*(3), 121-126.

Forsyth, P. (2006). Martin Kunz memorial lecture. Tourism benefits and aviation policy. *Journal of Air Transport Management*, *12*(1), 3-13.

Fu, X., Zhang, A., & Lei, Z. (2012). Will China's airline industry survive the entry of high-speed rail? *Research in Transportation Economics*, *35*(1), 13-25.

Gittell, J. H. (2005). *The Southwest Airlines way*. New York, NY: McGraw-Hill.

Godfrey, N. (2008). Why is competition important for growth and poverty reduction? OECD Global Forum on Investment, Department for International Development, London, UK.

Graham, A., & Dennis, N. (2010) The impact of low-cost airline operations to Malta. *Journal of Air Transport Management*, 16 (3), 127-136

Li, M. L. (2012). 中国航油价全球居前 [Jet fuel price in China alleged the highest in the world]. Retrieved from http://epaper.bjnews.com.cn/html/2012-05/24/content_340605.htm?div=-1

Liu, X. T. (2012). 春秋航空公司独闯 IPO 王正华称年内有望上市 [Spring Airlines prepares to launch IPO]. Retrieved from http://www.cannews.com.cn/2012/0308/184701.html

Liu, X., & Mao, Y. (2007). 飞行流量管理系统技术探讨**[**A note on the air traffic management system**]**. *China Civil Aviation*, 2007 (12), 49-51.

Mason, K. J. (2000). The propensity of business travellers to use low cost airlines. *Journal of Transport Geography*, *8*(2), 107-119.

Morrison, S. A. (2001). Actual, adjacent, and potential competition: Estimating the full effect of Southwest Airlines. *Journal of Transport Economics and Policy*, *35*(2), 239-256.

Rey, B., Myro, R. L., & Galera, A. (2011). Effect of low-cost airlines on tourism in Spain. A dynamic panel data model. *Journal of Air Transport Management*, *17*(3), 163-167.

Shumsky, R. (2006). The Southwest effect, airline alliances, and revenue management. *Journal of Revenue and Pricing Management*, *5*(1), 83-89.

Statistics on Civil Aviation of China (2005-2011). Beijing, China: China Civil Aviation Press, 2005-2011.

Vowles, T. M. (2001). The "Southwest effect" in multi-airport regions. *Journal of Air Transport Management*, *7*(4), 251-258.

Wang, M., & Song, H. (2010). Air travel demand studies: A review. *Journal of China Tourism Research*, *6*(1), 29-49.

Williams A. M., & Baláž, V. (2009). Low-cost carriers, economies of flows and regional externalities. *Taylor and Francis Regional Studies*, *43*(5), 677-691.

Yueh, L. (2011). *Enterprising China: Business, Economic, and Legal Developments since 1979*. New York, United States: Oxford University Press.

Zhang, A., Hanaoka, S., Inamura, H., & Ishikura, T. (2008). Low cost carriers in Asia: Deregulation, regional liberalisation and secondary airports. *Research in Transportation Economics*, *24*(1), 36-50.

Zhang, Y. (2012). Are Chinese passengers willing to pay more for better air services? *Journal of Air Transport Management*, 25, 5-7.

Zhang, Y., & Round, D. K. (2008). China's airline deregulation since 1997 and the driving forces behind the 2002 airline consolidations. *Journal of Air Transport Management*, *14*(3), 130-142.

Zhang, Y., & Round, D. K. (2011). Price wars and price collusion in China's airline markets. *International Journal of Industrial Organisation*, *29*(4), 361-372.

Zhang, Y., & Round, D. K. (2012). Competition policy and its relevance to SMEs. *Frontiers of Law in China*, *7*(2), 21-38.

Zhang, Z. W., & Meng, H. (2005). 民营奥凯航空重新调整定位 放弃低成本战略 [Okay Airlines repositions itself and gives up low cost model]. Retrieved from http://www.tj.xinhuanet.com/news/2005-10/19/content_5388225.htm